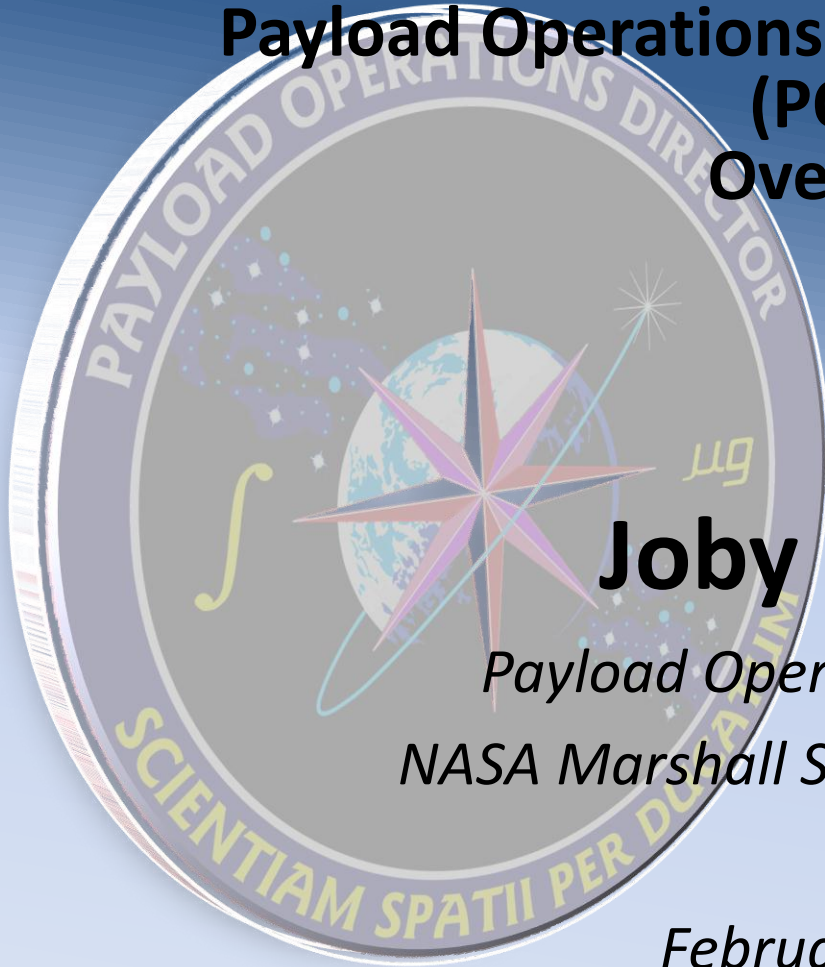


ISS Payload Operations & Integration Center (POIC) Overview



Joby Minor

*Payload Operations Director
NASA Marshall Space Flight Center*

February 2015

ISS Fast Facts

- Velocity = 17,500 mph
- Approx. 250 miles altitude
- 1 orbit every 90 minutes
- 5 International Partners
- 16 Nations Overall
- 6 Mission Control Centers
 - NASA (HOU & HSV, USA)
 - Roscosmos (Moscow, Russia)
 - CSA (Montreal, Canada)
 - ESA (Munich, Germany)
 - JAXA (Tsukuba, Japan)
- Nominal 6 person crew
 - 3 US & International Partner
 - 3 Russian
 - Rotate every 4-6 months
- 1-year US crew member in 2017



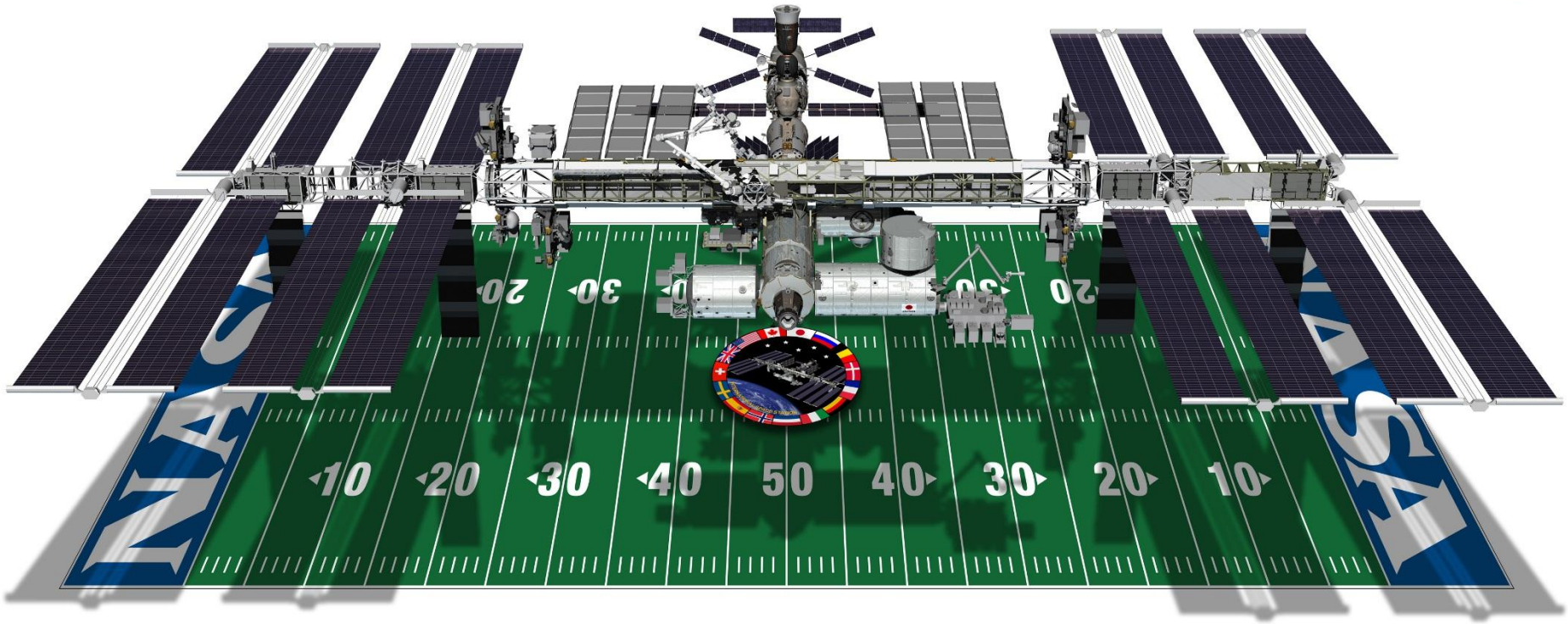
Assembly Complete



11-year Assembly

ISS

National Aeronautics and Space Administration



www.nasa.gov

As Long As a Football Field

Segments

US Segment

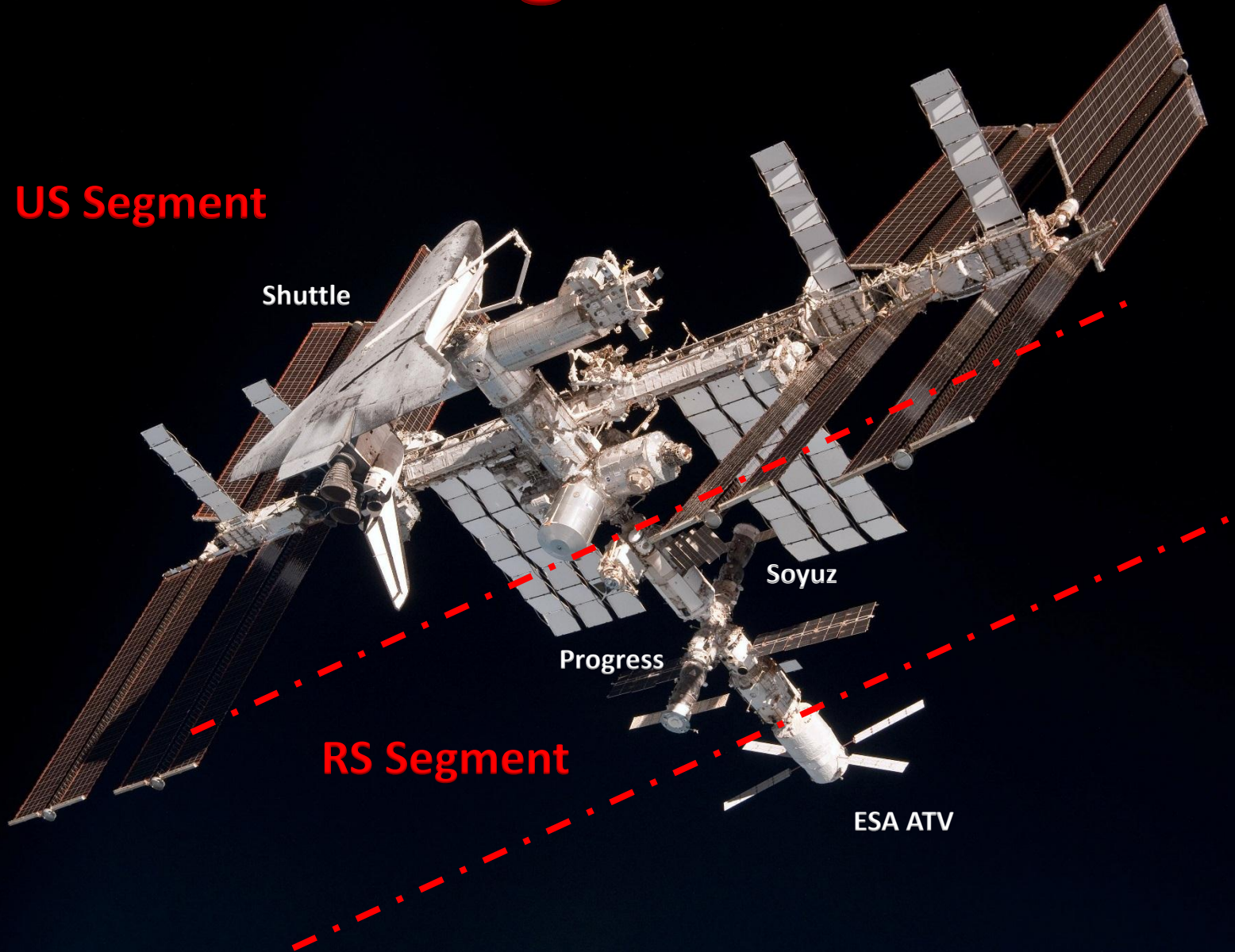
Shuttle

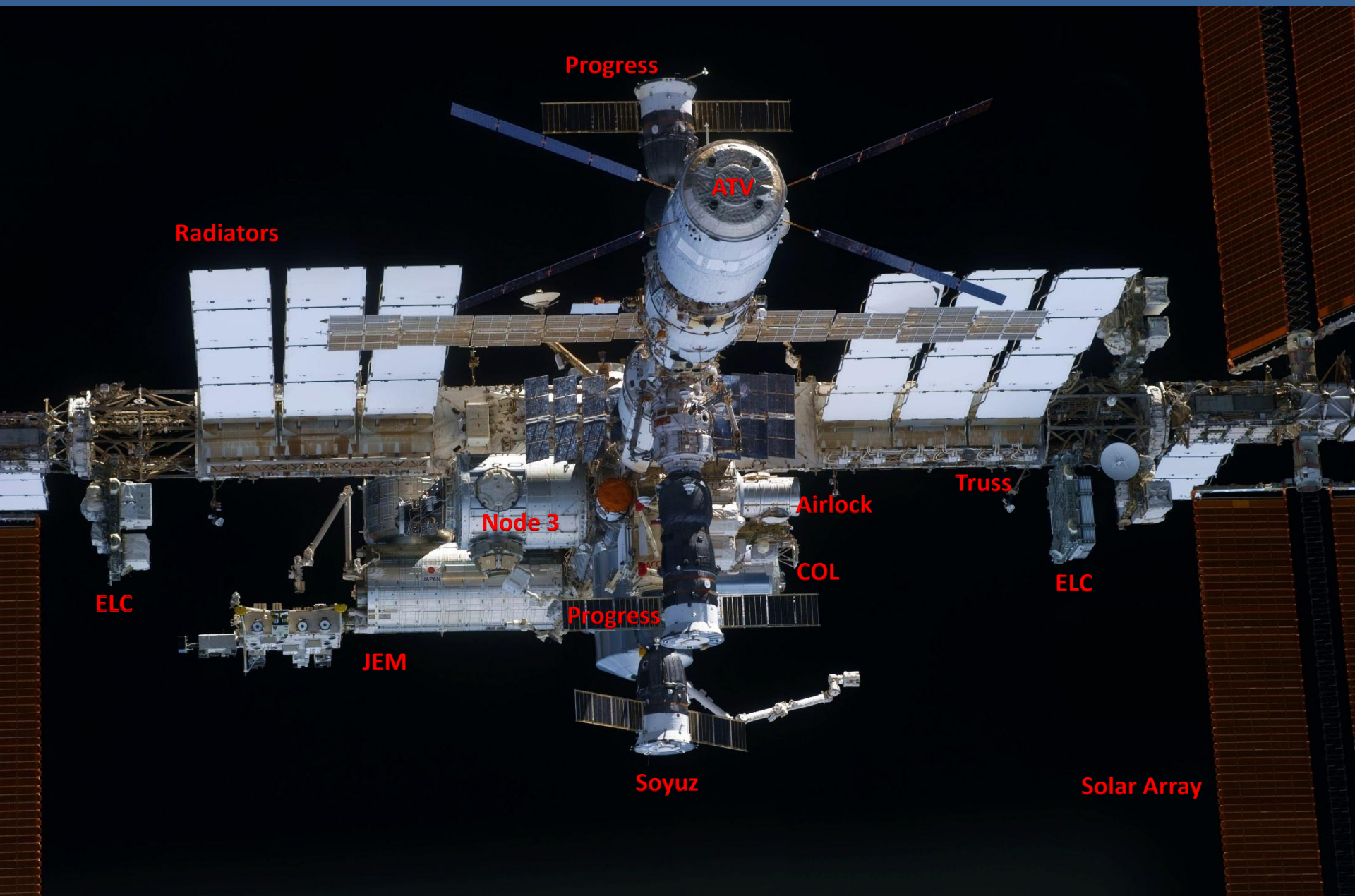
Soyuz

Progress

RS Segment

ESA ATV





Progress

ATV

Radiators

Node 3

Airlock

Truss

ELC

COL

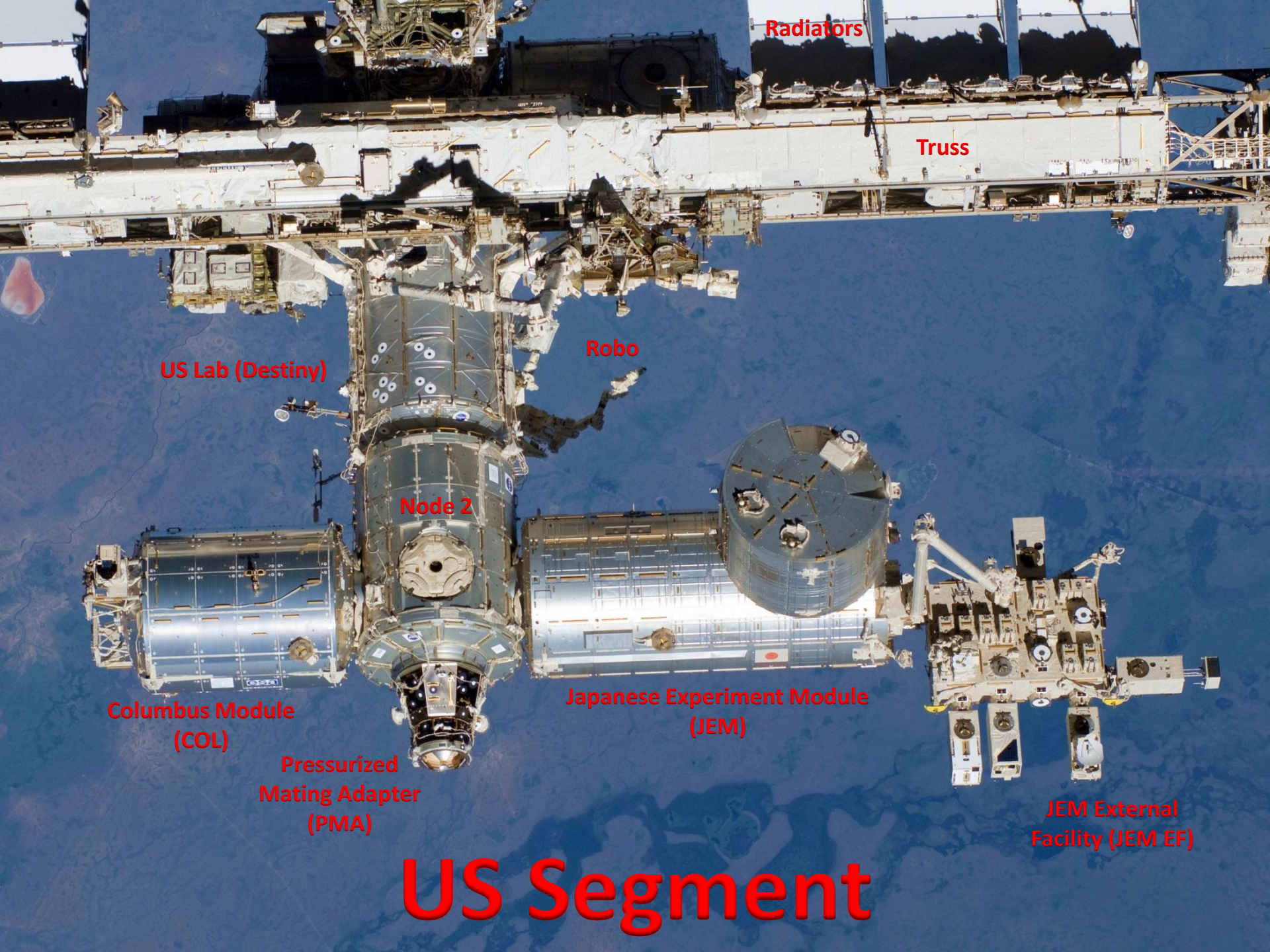
ELC

JEM

Progress

Soyuz

Solar Array



Radiators

Truss

Robo

US Lab (Destiny)

Node 2

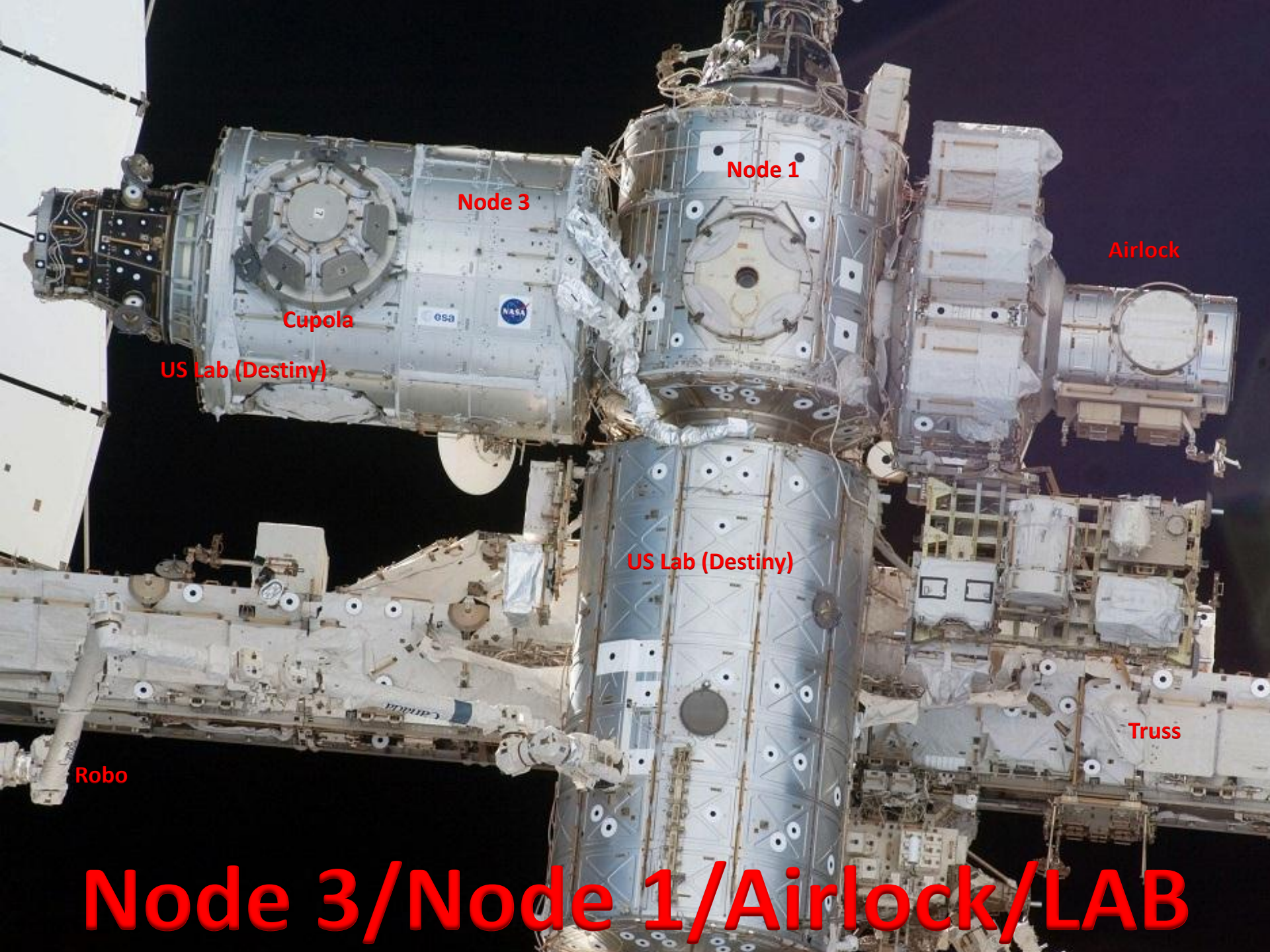
Columbus Module
(COL)

Pressurized
Mating Adapter
(PMA)

Japanese Experiment Module
(JEM)

JEM External
Facility (JEM EF)

US Segment



Node 1

Node 3

Cupola

US Lab (Destiny)

Airlock

US Lab (Destiny)

Truss

Robo

Node 3/Node 1/Airlock/LAB

Increment 42 Crew





Soyuz Launch



Soyuz On-Orbit



Houston - Mission Control

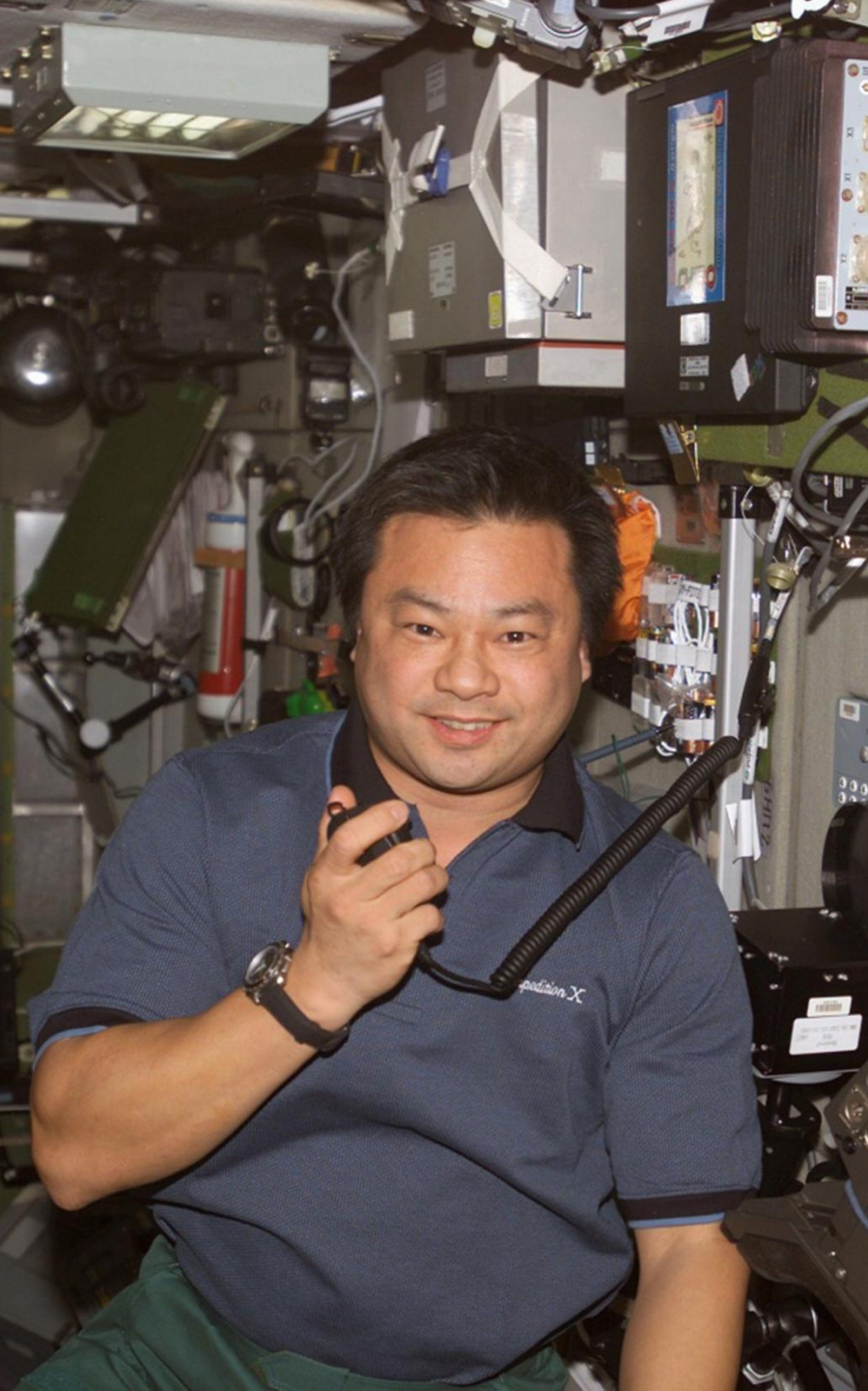


Huntsville - Payload Ops

Payload Operations Director (POD)

(That's ME!...well, one of many)

- **Manager of real time payload execution activities for all NASA/US payloads (including National Lab (CASIS)).**
- **Multiple management styles.**
- **28 certified PODs on the current roster.**
- **Type A personalities (needed in order to 'take charge', 'make decisions', 'protect crew/vehicle' and 'advocate for payloads'.**
- **People look to us to make the day a successful one.**
- **1-2 years to certify in position.**
- **Educational backgrounds in science, math.**
- **We work/talk directly with astronaut crew & International Partners**
- **Must 'sim' bad days in order to be prepared for one.**



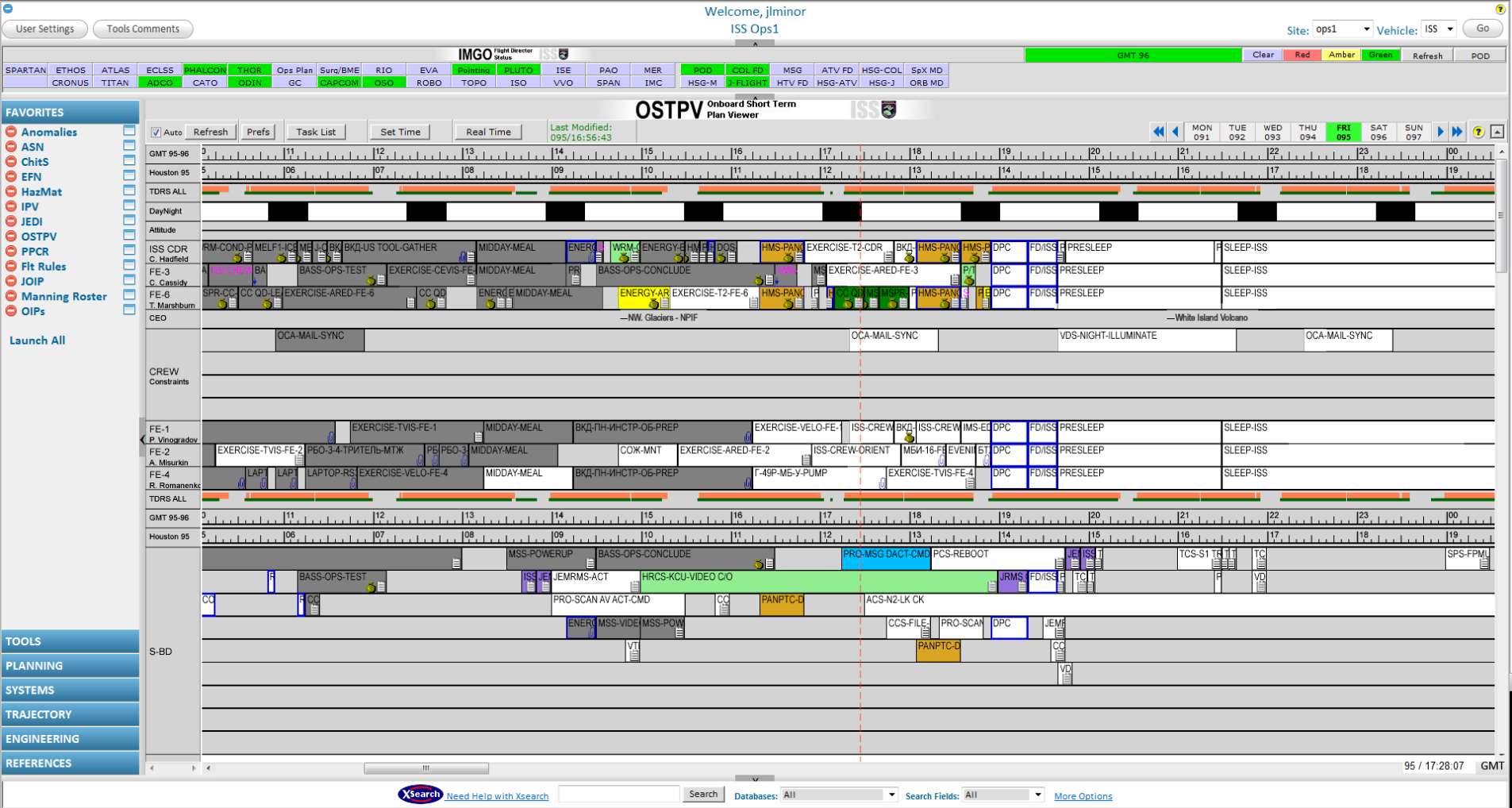
POIC Facts

- Science 24/7/365 (3 shifts)
- POD manages Flight Control Team (FCT) and answers directly to Flight Director in Houston
- Certified Flight Controllers
- Payloads are crew/non-crew
- Payloads are both internal/external
- We work/talk directly with astronaut crew & International Partners
- Russians are now starting to participate in our science activities.



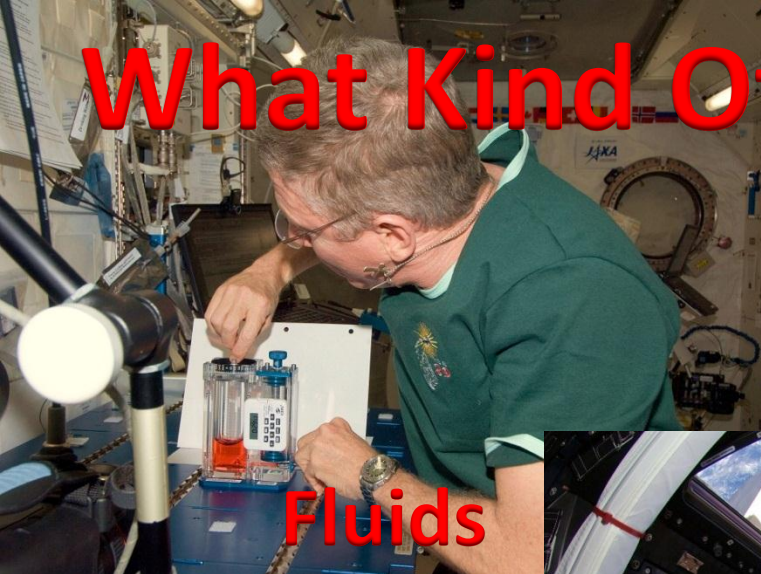
POIC Facts

- Always a POD on console no matter what.
- 8 Certified Flight Console Positions used.
- HSV integrates International Partner payloads into planning system.
- HSV distributes data/video to International Partners
- Unique position:
 - on orbit crew depends upon us
 - FD depends upon us
 - International Partners depend upon us



Crew/Ground Timeline

What Kind Of Science Do We Do?



Fluids



Materials



Earth Obs



Biological



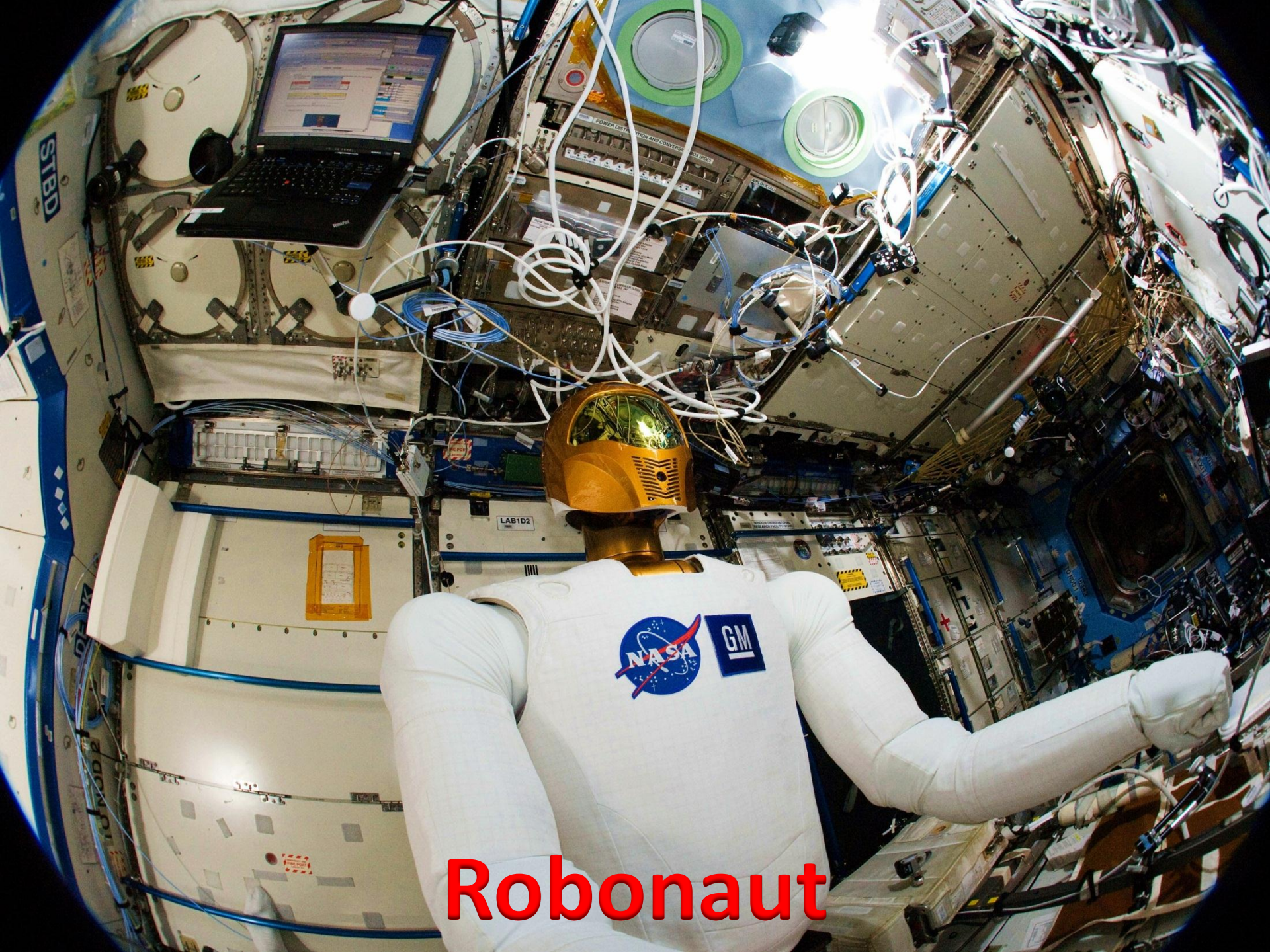
Combustion



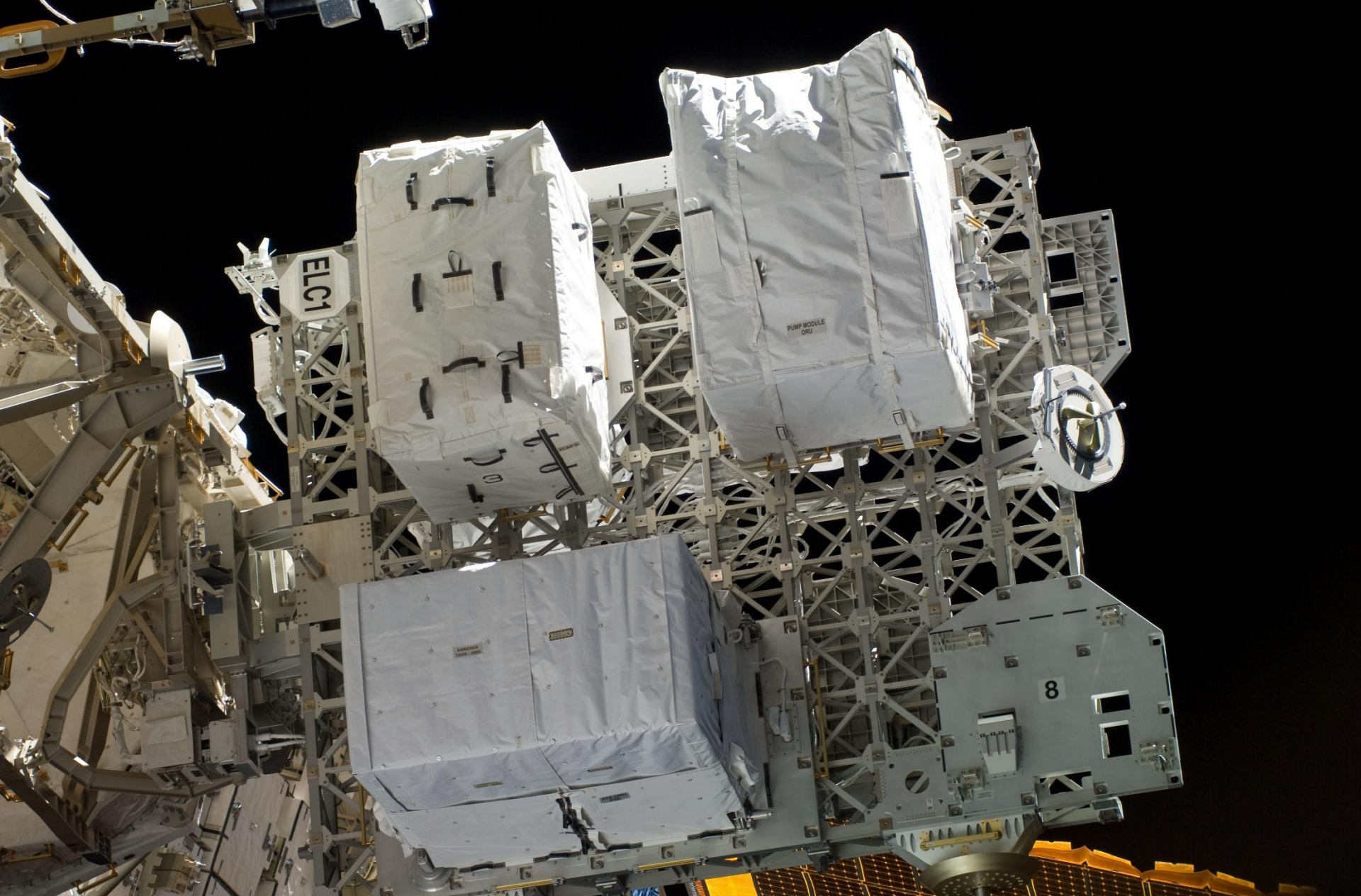
Microgravity Science Glovebox



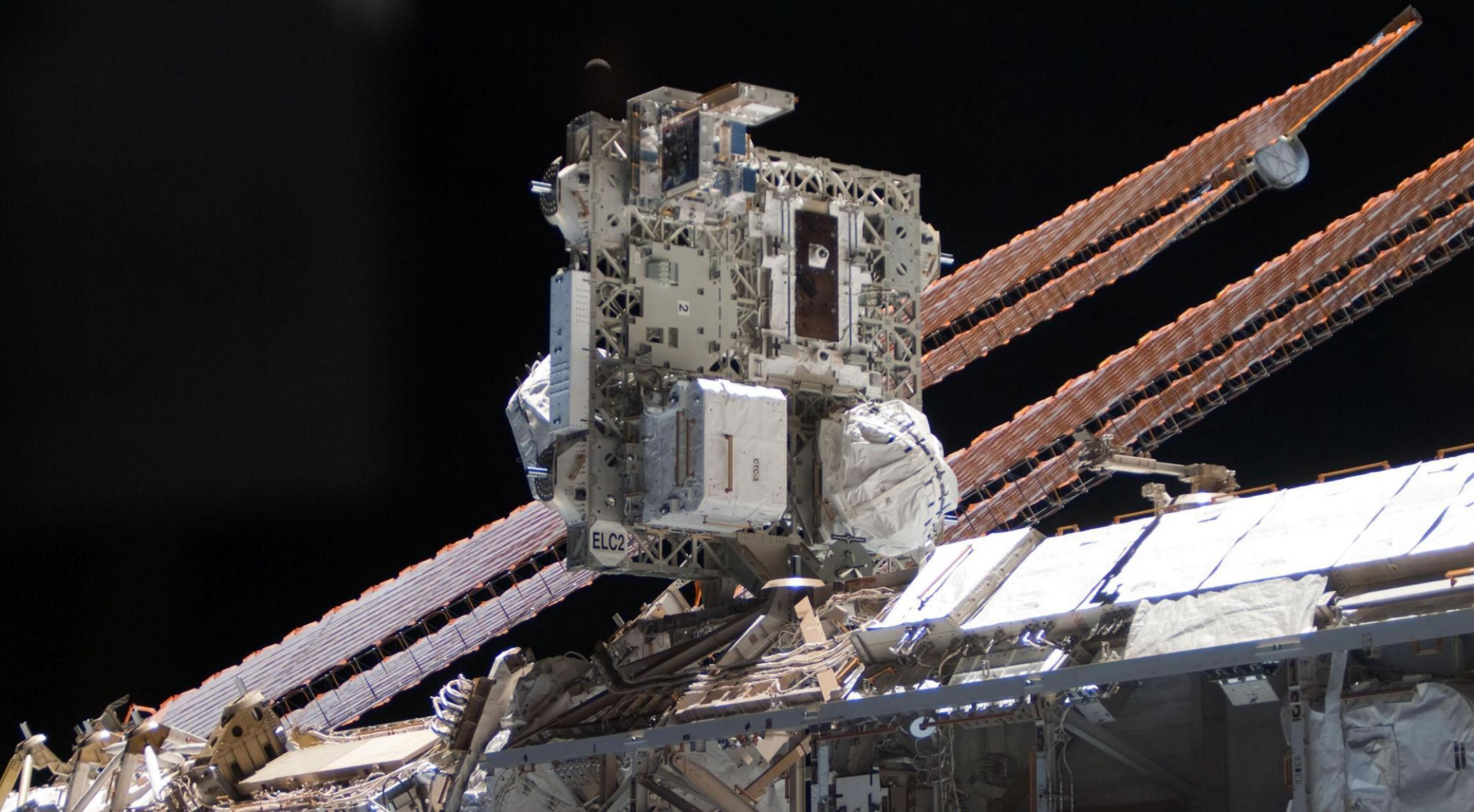
MELFI Freezer



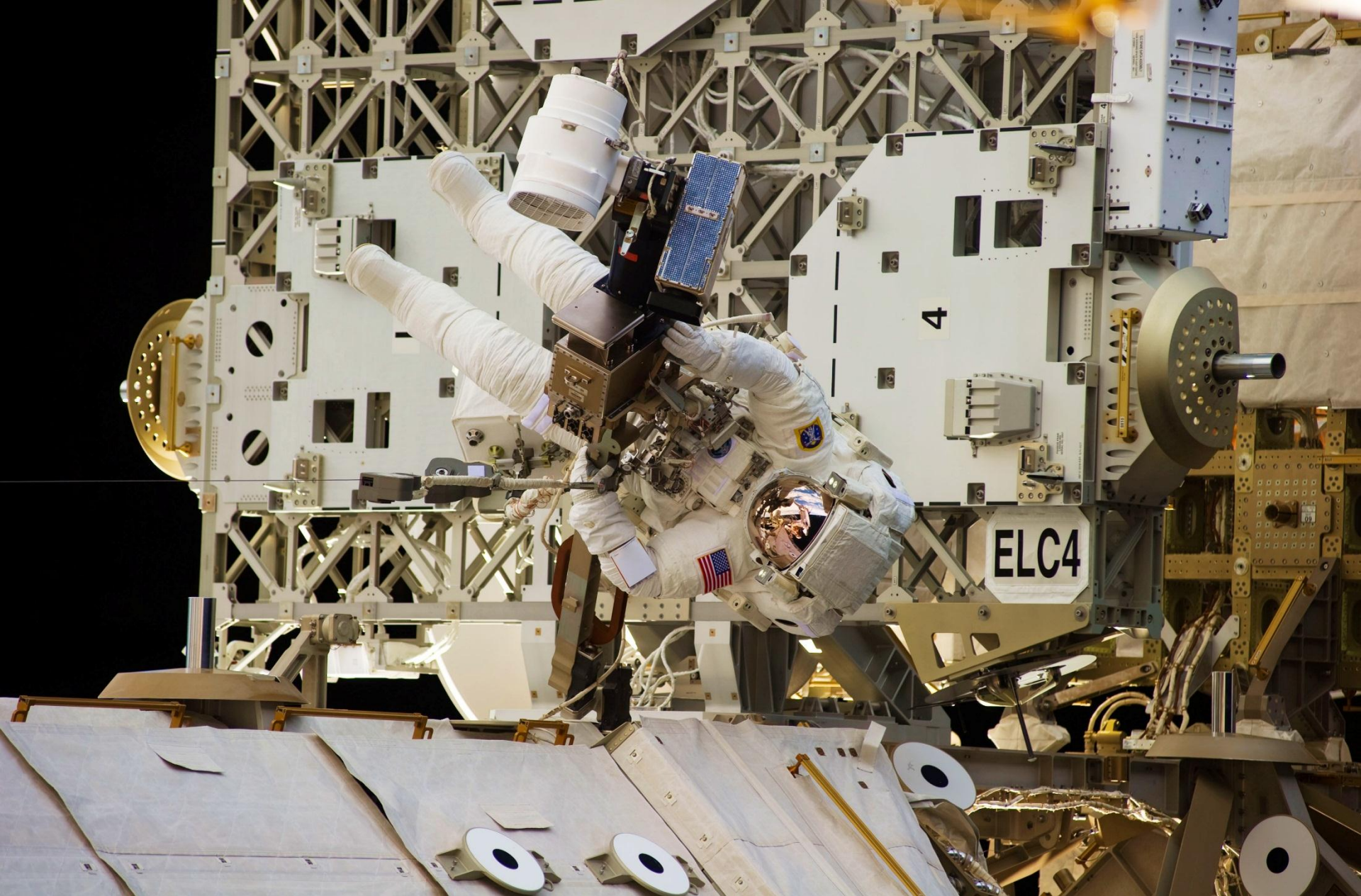
Robonaut



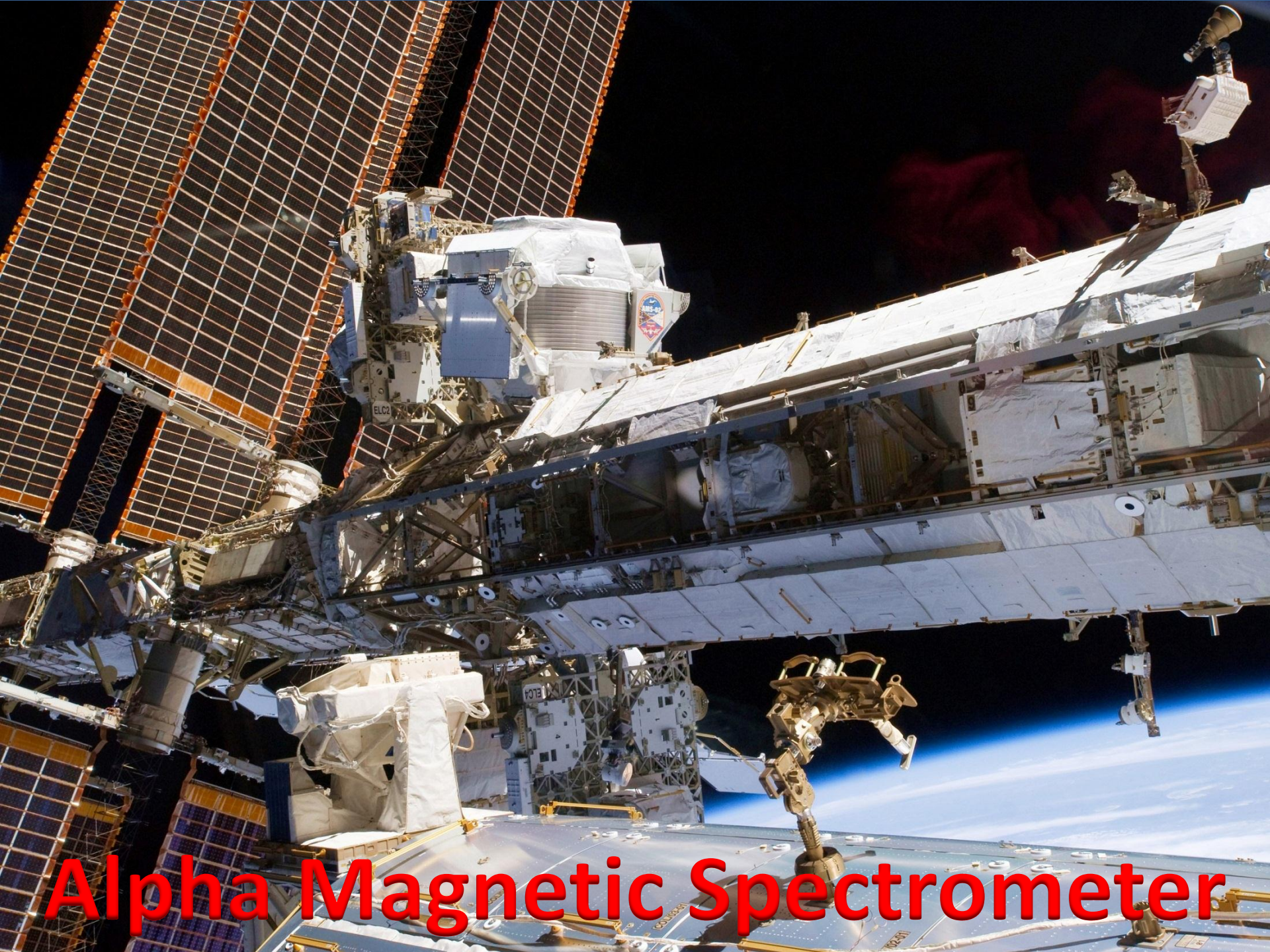
ExPRESS Logistics Carrier (ELC-1)



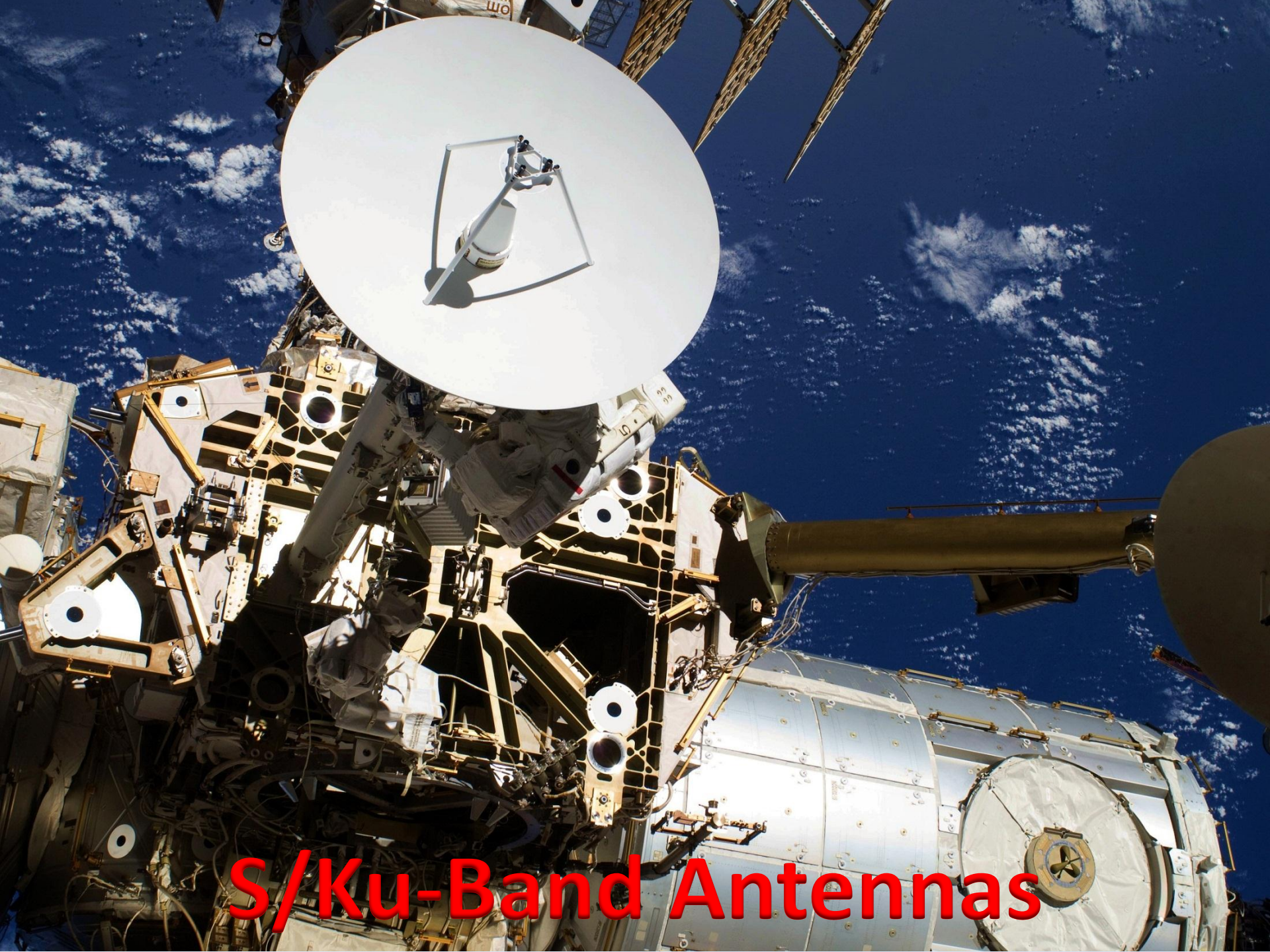
ExPRESS Logistics Carrier (ELC-2)



ExPRESS Logistics Carrier (ELC-4)



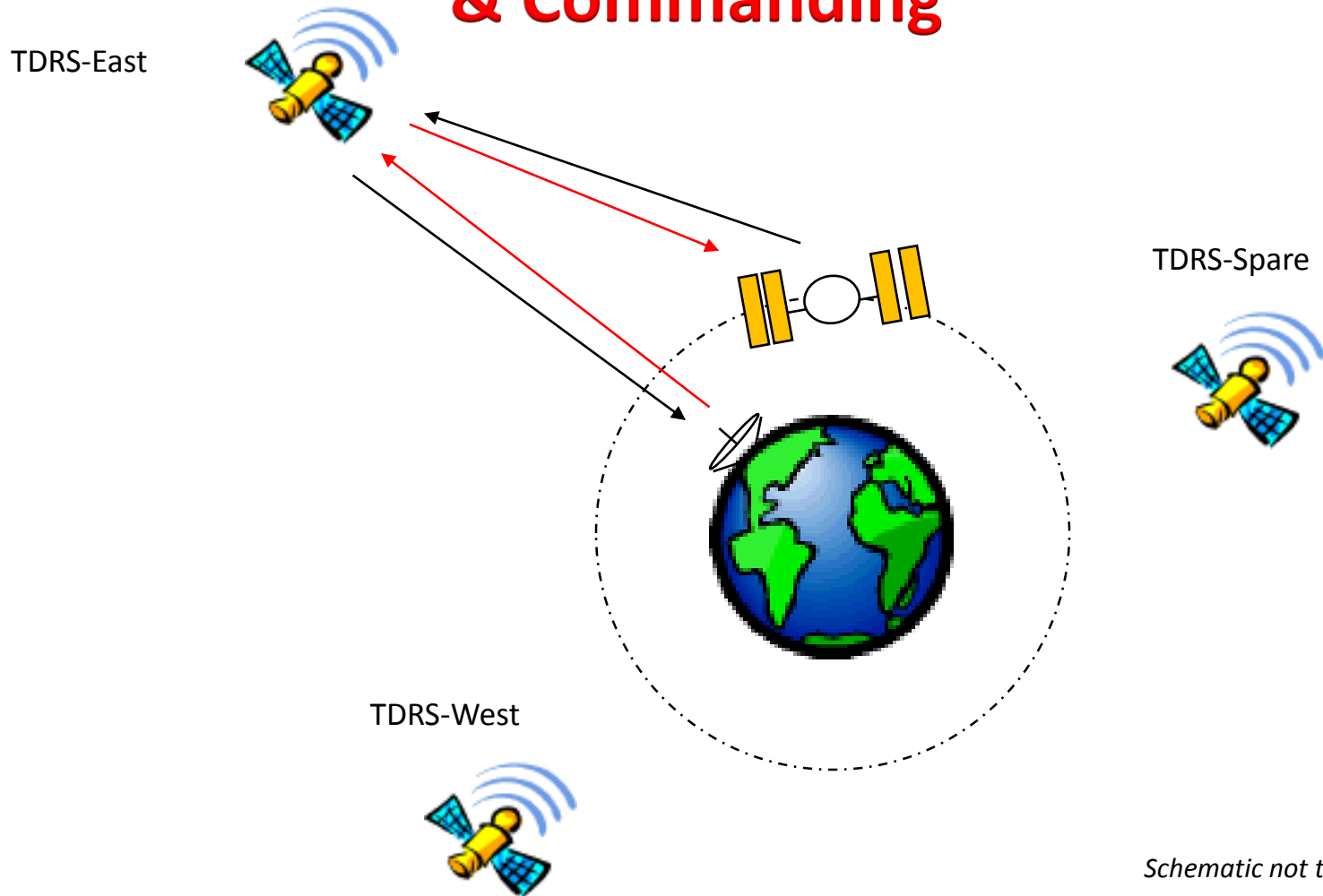
Alpha Magnetic Spectrometer



S/Ku-Band Antennas

S-Band/Ku-Band Antennas

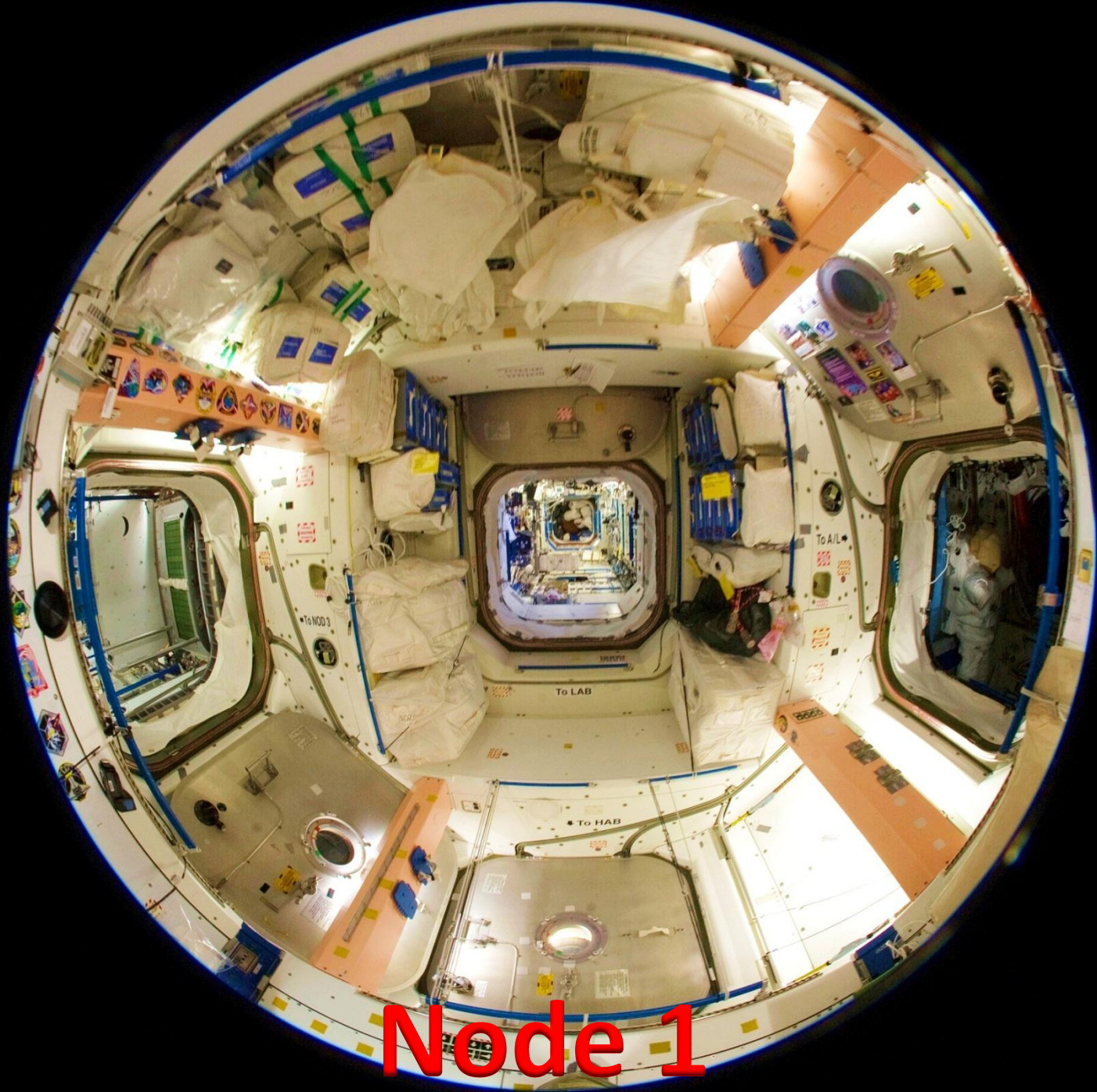
Voice/Data/Video Communications & Commanding





Cupola





Node 1



- **Nodes 1, 2, 3** serve as galley, sleep quarters, exercise room, restroom.
- Each crew member must exercise everyday.
- Each crew member has own, private sleep quarters.
- Midday meals can be scheduled separately but most crews eat together each day – including Russians.

Visiting Vehicles



HTV-II - Japan



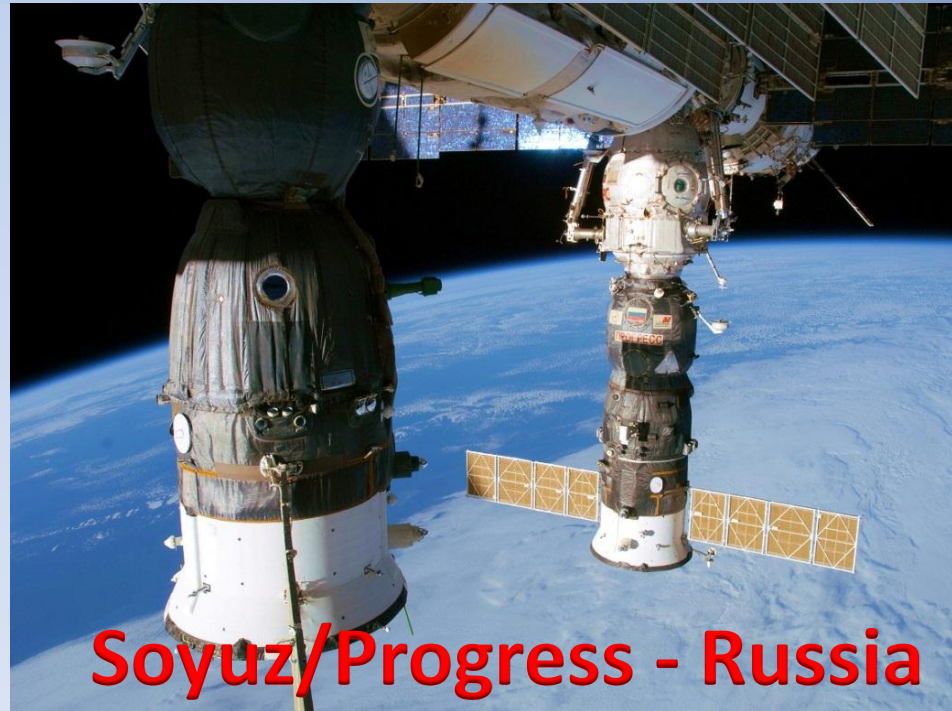
ATV - Europe



Orbital Cygnus - USA



Space-X Dragon - USA



Soyuz/Progress - Russia



Astronaut/POD TJ Creamer

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<http://www.nasa.gov/station>

Space Station for Researchers

Space Station for Educators

<http://www.youtube.com/watch?v=hyn1We0wOT8>

YouTube ISS video tour

